

Wide Range Neutron Detector, Phase I

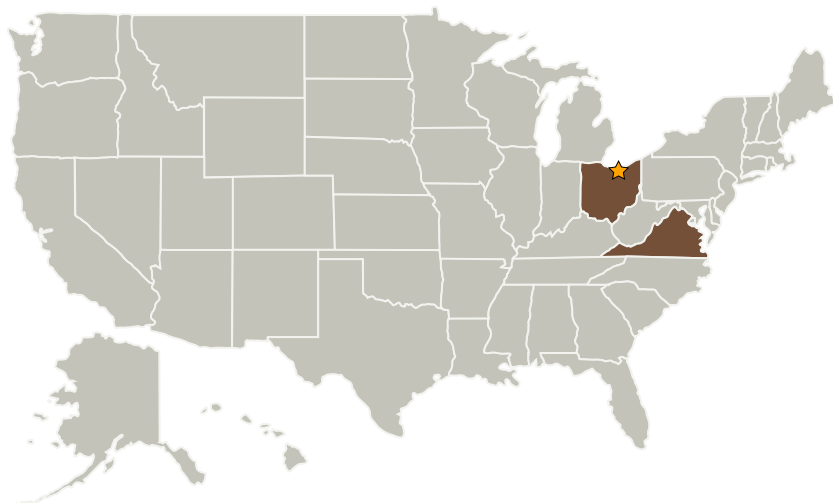
Completed Technology Project (2005 - 2005)



Project Introduction

Current design concepts of nuclear reactors for space applications are well advanced in core configurations and architectural design. There is a need to determine how such systems will be monitored and instrumented. We propose to adapt a Wide Range Neutron Detector (WRND) system currently in use at nuclear research facilities for its operation in the space environment. This new system can then be utilized to monitor and control a space-based nuclear power reactor. The system is capable of measuring neutron fluxes in the whole reactor's operation range, from a neutron flux of $10E0$ n/cm²/sec up to a flux of more than $10E10$ n/cm²/sec. In this way, a single instrument chain can be used instead of having different instrumentation for each of the operation ranges of the reactor (start-up, ramping-up, and nominal power) This is a clear advantage for space applications where mass, size, and power consumption constraints are of premium importance. A WRND would allow for a reduction in the complexity of space-based nuclear instrumentation and control systems. A ground version of the proposed system is presently being installed in a research reactor in Australia.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Aurora Flight Sciences Corporation	Supporting Organization	Industry	Cambridge, Massachusetts

Primary U.S. Work Locations

Ohio	Virginia
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Javier Deluis

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - └ TX03.1 Power Generation and Energy Conversion
 - └ TX03.1.6 Other Advanced Concepts for Generating/Converting Power